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MARTHA ANN FINNEGAN  
CABOT CORPORTATION  
BILLERICA TECHNICAL CENTER  
157 CONCORD ROAD  
BILLERICA, MA 01821-7001

EXAMINER

CROCKFORD, KIRSTEN ANNE

ART UNIT PAPER NUMBER

1762

DATE MAILED: 07/30/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/308,770

Applicant(s)

SCHWERTFEGER, FRITZ

Examiner

Kirsten Crockford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20-22 and 24 is/are rejected.
- 7) ☒ Claim(s) 19 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. In view of the Appeal Brief filed on May 9, 2002, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

2. On page 3 of Applicant's Appeal Brief, Applicant pointed out that claim 13 is no longer rejected under prior art. Upon further reconsideration of claim 13 and the Lentz reference (US 3,122,520), it is the Examiner's position that claim 13 should be rejected over the Lentz reference and therefore this action is made non-final.

3. Applicant's proposed After-final amendment filed on November 15, 2001 has been entered. As noted in the Advisory Action of December 17, 2001, Applicant's submission of a certified translation of the priority German patent application DE 196 48 797.8 has overcome the prior art rejections over the Burns et al. (US 5,750,610) reference.

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4. Claims 1-18, 20-22, and 24 are rejected over the Lentz reference under 35 USC 102(b) and 103(a) as discussed below.

***Specification***

5. The disclosure is objected to because of the following informalities: On page 21, line 14, "15 [16?] mW/mK" is objected to because it is unclear which conductivity is correct. On page 22, line 11, "(0. ? wt. %" is objected to because it is unclear what the weight percent is.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2, 9-12, 14-15, 17, and 21-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lentz (US 3,122,520).

Lentz is applied for the same reasons set forth in the prior Office actions. The claims are rejected under 35 USC 102(b) because Lentz clearly teaches a process comprising the steps of

converting the hydrogel to an organogel, and mixing the hydrogel/organogel with an organosilicon compound to perform the hydrophobing reaction (col. 3, lines 15-65). Lentz teaches that the step of converting the hydrogel to an organogel may occur prior to, simultaneous with, or subsequent to the step of mixing with the organosilicon compound. Lentz specifically teaches at col. 3, lines 49-53, "The organic solvent can be added prior to, simultaneously with, or subsequent to the addition of the organosilicon compound. That is the silica hydrogel can be *first* converted into an organogel by *replacement of the water with an organic solvent* [emphasis added]." Lentz teaches a small group of organosilicon compounds that may be used to perform the hydrophobing reaction at col. 4, lines 11-27; this group includes hexaethyldisiloxane which meets Applicant's claimed disiloxane formula. Therefore, Lentz teaches performing its process of *first* washing the lyogel with an organic solvent to *replace* the water with organic solvent, followed by a step of hydrophobing using one of its preferred organosilicon compounds which includes hexaethyldisiloxane.

Alternatively, it is noted that Example 10 in col. 7 discloses a process whereby a hydrogel is washed with ethanol "to remove the water and then with methylene chloride to remove the alcohol and the resulting organogel is mixed with sufficient trimethylchlorosilane to give .08 trimethylsilyl group per SiO<sub>2</sub> unit in the gel..." (col. 7, lines 27-31). While it is noted that this embodiment does not use a disiloxane having the claimed formula as the organosilicon compound, it is the Examiner's position that the Lentz reference would have suggested to one skilled in the art that any of the organosilicon compounds taught by Lentz in col. 4, lines 11-27, would have been suitable for use as the organosilicon compound in place of those compounds used in the specific examples. It would have been obvious for one having ordinary skill in the

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art to have substituted one of the organosilicon compounds taught in col. 4, such as hexaethyldisiloxane, for the organosilicon compound specifically used in Example 10 (trimethylchlorosilane) with the expectation of similar and successful results since Lentz teaches that the organosilicon compounds in col. 4 are “operative” in its invention.

With respect to Applicant’s new limitation that the lyogel is “essentially free of water” and claim 9, it is the Examiner’s position that the organogel of Lentz is inherently free of water (which is necessarily less than 5 wt %) since Lentz teaches that the water is “removed” and the organic solvent “replaces” the water.

In the Appeal Brief, with respect to claim 1, Applicant argues that Lentz uses certain organosilicon compounds, specifically certain silanes and siloxanes including chlorine-containing organosilicon compounds, and that the organosilicon compounds of Lentz do not include the disiloxanes of the present invention. The Examiner disagrees. At col. 4, lines 11-27, Lentz states “The organosilicon compounds which are operative in this invention include: Diethyldichlorosilane, ... Hexaethyldisiloxane, ...”. Hexaethyldisiloxane meets Applicant’s claimed disiloxane compound formula. Applicant also argues that Lentz never adds a disiloxane silylating agent  $R_3Si-O-SiR_3$  to a lyogel that has first been washed with an organic solvent, because Lentz does not wash its hydrogel. Rather, Applicant argues that Lentz merely admixes solvent and organosilicon compounds into a hydrogel. While it is noted that Lentz teaches an embodiment where organosilicon compound is mixed with solvent, Lentz clearly teaches an embodiment of its invention where organic solvent is added to a hydrogel prior to the addition of the organosilicon compound. This “washing” embodiment is demonstrated in Example 10 as discussed above. Applicant argues that Example 10 is an aberration in Lentz, in that a hydrogel

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is washed to remove the water, but Lentz does not then use a disiloxane silylating agent as required by present claim 1. The Examiner disagrees. It is the Examiner's position that Example 10 is not an aberration and that it clearly demonstrates the embodiment described in col. 3, lines 49-53 where organic solvent is first added to the hydrogel to convert it to an organogel by replacing the water with organic solvent, and then reaction with the organosilicon compound is performed. While Example 10 does not disclose use of a disiloxane having the claimed formula, as discussed above, Lentz teaches a list of suitable organosilicon compounds operative in its invention. The Lentz reference clearly suggests use of any of the listed compounds in its disclosed embodiments. Alternatively, it would have been well within the skill of an ordinary artisan to have selected one of the organosilicon compounds taught as "operative" in the invention in col. 4 for use with the embodiment described in Example 10 with the expectation of similar and successful results.

Claims 2, 10-12, 14-15, 17, and 21-22 are rejected for the same reasons discussed in the prior Office actions.

***Claim Rejections - 35 USC § 103***

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz.

As to claim 13, it is noted that Lentz teaches using hexamethyldisiloxane as the organosilicon compound in Examples 1 and 2. While Lentz does not teach hexamethyldisiloxane as one of the preferred organosilicon compounds in col. 4, lines 13-27, it is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have used hexamethyldisiloxane as the organosilicon compound in the embodiment discussed

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above (the embodiment demonstrated in Example 10) with the expectation of similar and successful results since hexamethyldisiloxane is demonstrated as a useful hydrophobing agent in Examples 1 and 2, and since hexamethyldisiloxane is chemically materially similar to hexaethyldisiloxane which is taught as an operative organosilicon compound in col. 4 of Lentz.

10. Claims 3-8, 16, 18, 20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lentz as applied to claims 1-2, 9-15, 17, and 21-22 in view of Frank et al. (US 5,866,027).

The claims remain rejected for the same reasons discussed in the prior Office actions. Applicant argues that there is no objective suggestion to combine the references of Lentz and Frank et al. and then modify them to meet the elements of the claims in the present application. Applicant argues that there is nothing in Lentz that would lead one skilled in the art to seek structural reinforcement of the Lentz aerogels, since this would plainly interfere with their use as powdered filler in rubber. The Examiner notes that Frank et al. was applied to demonstrate prior art methods for producing hydrogels, to teach the known prior art steps of aging aerogels, increasing the mechanical stability of aerogels, and subcritical drying. It remains the Examiner's position that it would have been obvious to have combined the teachings of Frank et al. with the method of Lentz for the reasons discussed in the prior Office actions, particularly since the references are similarly directed to the production of xerogels/aerogels. The test of obviousness is not express suggestion of the claimed invention in any or all references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them. *In re Rosselet*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965); *In re Hedges*, 783 F.2d 1038.



*Allowable Subject Matter*

11. Claims 19 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Upon further consideration, it is noted that Lentz does not teach a step of washing the lyogel with a solution of an orthosilicate.


*Conclusion*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten Crockford whose telephone number is 703-306-5461. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 703-308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

kac  
July 25, 2002

  
SHRIVE P. BECK  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700